BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Certificate in Information Technology Pearson BTEC International Level 3 Subsidiary Diploma in Information Technology Pearson BTEC International Level 3 Foundation Diploma in Information Technology Pearson BTEC International Level 3 Diploma in Information Technology Pearson BTEC Level 3 National Extended Diploma in Information Technology
Unit number and title	**Unit 18: The Internet of Things**
Learning aim(s) (For NQF only)	**B:** Develop a design for an Internet of Things system or device to solve a problem **C:** Carry out the prototyping of an integrated Internet of Things system or device to solve a problem
Assignment title	Design and develop an Internet of Things (IoT) prototype
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You have recently started work as an IT technician in the technical department of a small company that specialises in security systems and burglar alarms. The director of the company is interested in investigating if the company could make use of IoT technologies in its products and services and your manager has asked you to develop a prototype system which uses this technology. The problem that the directors are keen to solve is that their current alarms simply ring an alarm bell when they detect an intruder. They would like the alarms to be able to notify the home owner when an intruder is detected.

Task 1	Following your investigation into IoT technologies your manager has asked you to design and create a prototype system which solves the problem with the company's current alarm systems. The prototype will, using a Raspberry Pi or similar microcomputer, detect movement within a room using a PIR sensor or camera and send an email alert to a pre-set email account

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	You need to: • Produce a design for the prototype system which adheres to the principles and characteristics of IoT. The design should include details of: o The architecture, including M2M system and device architecture (sensors, wired/wireless communications, actuators, and device, network and application domains) o Standards, including M2M interfaces and reference frameworks. o communication requirements including system and device communication principles and capabilities, identification and location of secured network components o security of the system including potential security threats, remote management, effects of attacks and security protection methods • Review the design with at least two other people to help you make improvements and create a second optimised version of the design annotated to show the improvements you have made following the feedback. • Write a justification of the decisions you made in the design you have created, showing how they will help to create an effective IoT solution. • Develop an optimised and functional prototype of the system and test the system to show that it meets the requirements. This should include: o Connected and normalised M2M operations o Device management o Use of a database for device data o Processing and action management o A visualised dashboard o Programming techniques and constructs such as the use of a software development environment, hardware device set up and visual and non-visual programming constructs o Use of IoT analytics • Write an evaluation of both the design, which you optimised using feedback, and the completed prototype system. You should consider a comprehensive range of risks and benefits of the system and also review security, legal and sustainability issues. You evaluation should also reflect on your own performance during the design and development of the system. • Provide evidence that you have demonstrated effective self-management (for example by planning your time effectively) and taken individual responsibility (for example by dealing with problems you encountered) while working on this assignment Overall your work needs to be easy to read by a third party, logically structured with appropriate use of technical language and a high standard of written English throughout
Checklist of evidence	Initial design documentation

required	Feedback on your initial design from at least two people Updated version of the design annotated to show the changes Written justification of your design decisions Evidence of the prototype system such as photographs, screenshots, test results and print outs. Written evaluation of your design and prototype. Evidence of effective self-management and individual responsibility

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
BC.D2	Evaluate an optimised IoT system or device design to solve a problem against the client's requirements and using feedback from others.
BC.D3	Optimise the prototype IoT system or device to solve a problem as intended and that meets the client's requirements, demonstrating individual responsibility and effective self-management.
B.M2	Justify design decisions, showing how the system or device design will result in an effective IoT system or service solution.
C.M3	Develop a functional prototype IoT system or device to solve a problem as intended and that meets the client's requirements.
B.P3	Produce an IoT system or device design to solve a problem, including the architecture, standards, communication requirements and security.
B.P4	Review the IoT system or device design with others to identify and inform improvements.
C.P5	Develop a prototype IoT system or device with partial functionality to solve a problem.
C.P6	Review the extent to which the IoT system or device meets the client's requirements

Sources of information to support you with this Assignment	Websites http://www.raspberrypi-spy.co.uk/2012/05/send-text-and-html-email-using-python/ Books McManus, S. Raspberry Pi Projects. 2013 John Wiley & Sons 978-111855543
Other assessment materials attached to this Assignment Brief	*e.g., work sheets, risk assessments, case study*

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